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EVALUATION OF S211 TRAINER BY CHINESE PILOTS

by

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Evaluation of S211 Trainer By Chinese Pilots

Early November in Beijing, winter had just started and the weather was slightly chilly. On November 5, 1988, at an Air Force base to the north of Beijing, the officers of the Air Force Scientific and Technological Research Department have been preparing rather intensively for the arrival of the S211 trainer. At 3:30 in the afternoon, the S211 jet trainer, with its red identification mark gleaming, lowered its altitude from 8,000 meters following the instructions of the air traffic controller and landed.

Based on the contract signed between the Italian Agusta Group and Air Force Scientific and Technology Research Department, the S211 trainer took off from Hongkong on November 4, 1988 and arrived at BaiYuen airport in Guangzhou at 7:30 AM. After a day of rest, the crews took off from BaiYuen airport at 9 AM the next morning and arrived at Beijing, with a temporary stop at Wuhan airport. From November 7 to November 9, S211 jet trainer had performed fantastic flight demonstrations in Beijing.

Ceremony for the S211 flight demonstration commenced at 9:30 on November 7. Mr. Gao, Wenhau, vice chairman of the Air Force Scientific and Technology Research Department, and Mr. Kerr, group leader of the Italian Agusta Group, addressed the audience and the participants.

More than 6000 experts and officers observed the three-day flight demonstration of S211 trainer. This flight demonstration proved to be a very successful one. Acrobatic maneuvers such as high-speed/low-speed flight, overload turn, 360-degree turn,

vertical climbing, side-way turn, up-side-down flight, and 8-point flight created a vivid image of its excellent performance.

Mr. Zhu, Zhenhua, deputy secretary of the department of academy of Chinese Air Force, Mr. Yu, Zhenguo, staff member, Mr. Yu, Li, head of technology examination of fighter and striker division of the department of military training of Chinese Air Force, and Mr. Wang, Ginli, researcher staff of research department of test flight center of the Chinese Air Force, joined test flight pilot, Mr. Babolis, in several flights of S211 to gain the first-hand feeling.

In the afternoon of November 9, a discussion meeting was held between the Italian and Chinese pilots. Mr. Babolis, test flight pilot of S211, invited Chinese Air Force pilots to evaluate the performance of S211 in categories such as engine performance, handling performance, taking-off, landing, climbing performance, and cockpit instrument layout, etc. Mr. Zhu, Zhenhua, deputy secretary of the department of academy of Chinese Air Force, accepted the invitation with pleasure and stated his /1 feeling about the S211 jet trainer.

"S211 trainer is an excellent trainer, especially an excellent basic trainer. I have been flying trainers from four countries last year and I feel that S211 is an excellent jet trainer. To determine if a trainer is adequate or not, we need to evaluate its performance from the standpoint of training system. Based on the performance alone, S211 can satisfy all the needs of basic training of the flight academy. The engine equipped is an excellent engine, especially the acceleration performance is

superior. During flight, pilots can have great confidence on the engine and delicate control of the throttle is not necessary. The residual thrust is ample and the altitude of the plane will not be suffered even if difficult maneuvers were performed. In this way, the air usability of the plane can be extended during training flight. The handling and safety features are also excellent and climbing can be achieved without arduous pulling of the handling bar. Because of its safety feature, it can accommodate beginning pilot students. Takeing-off and landing are similar to most other jet planes. The cockpit is spacious and the vision and working environment are both excellent. The pilot should feel very comfortable during flight. The lay-out of cockpit instrument is also very reasonable." said Mr. Zhu, Zhenhua.

After stating the merits of S211 trainer, vice chairman Zhu, Zhenhua also expressed his opinion on some of the points that need modification. "Because S211 adopted the umbrella-wing structure, the transverse handing performance is inferior to the longitudinal (vertical) handling performance. For the training of fighter pilots, the transverse handling performance should be improved in order to enhance the response of the pilots. Furthermore, the climbing/descending speedometer is one of the smaller meters of the dashboard. This meter, however, is a very important meter." said vice chairman Zhu.

After the evaluation of the S211 trainer by Chinese Air Force pilots, vice chairman Zhu also discussed the training system with Mr. Babolis and Mr. Kerr.

At the same time of the flight demonstration, technical meetings between the guests from Italian Augusta Group and experts from Chinese Air Force, Chinese Naval Aviation and Chinese aviation industry was held in the afternoon of November 8. The development, production, and sale of S211 trainer and its technical and performance details were introduced to the experts of Chinese Air Force, Chinese Navy, and Chinese aviation industry by Mr. Kerr.

S211 is a tandem two-seat mid-level trainer/fighter developed and manufactured by SIAI-Marchetti, a subsidiary company of the Agusta group of Italy with a development cost of US$15,000,000. The prototype's maiden flight occurred on March 17, 1981. Because of its low cost and low weight, the training cost can be reduced and the benefit ratio can be increased. The range of applicability of S211 is very wide. It can be used not only in basic training purposes but some of the high-level training courses as well. It can even be used to carry out ground attack missions in times of war. Ar present, 30 S211's were used by Singapore and 4 by Haiti.

The design of S211 was assisted by Boeing which also carried out the wind tunnel test. The wing structure was the hanging-arm upper single wing structure with super-critical wing pattern. Wing span to wing cord ratio was 5.08, 1/4 cord line after angle was $15^{o}30'$. Wing root relative thickness was 15%; wing tip relative thickness was 13%. The fully-automatic horizontal tail fin was not used in the design of the tail fin structure.

Power plant for S211 was the JT15D-4C non-augmented turbofan engine of Pratt & Whitney (Canada). Net thrust was 1,135 kilograms. Air intakes were placed on both side of the fuselage. The wing integral fuel capacity was 670 liters and the main fuel tank had a capacity of 130 liters. Two external fuel tanks of 250 liters of capacity could be attached to both wings.

The cockpit cover was an integral cover and opened to the right. Two Martin Baker MK10 tandem ejection seats were fitted in the pressurized and air-conditioned chamber. Ejection could take place at any altitude with a ejection speed of 110-740 kilometers/hour.

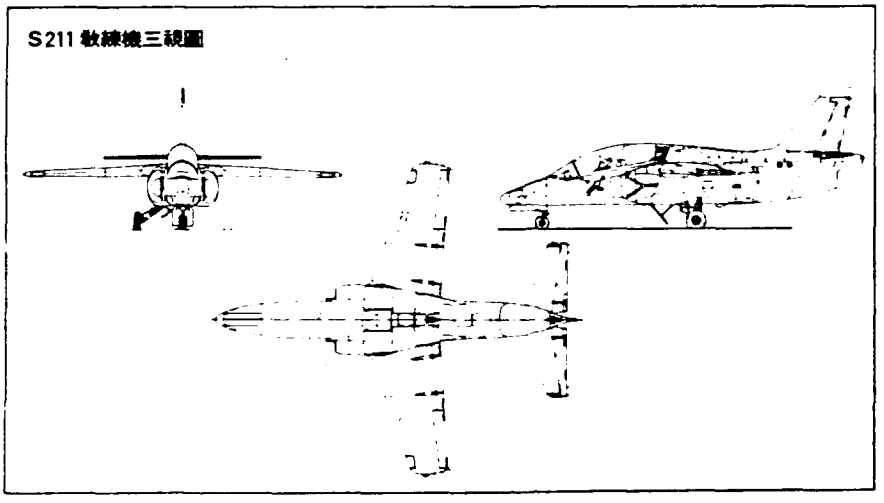
The major equipments of S211 are: automatic direction sensing meter, VHF all-direction wireless signaling device, instrument landing system, TUCANO, enemy identification, UHF/VHF communication station, and automatic flight direction reference system.

There are four underwing stations. The maximum allowed ordnance for the inside stations are 330 kilograms; and the allowed ordnance for the outside stations are 165 kilograms. Maximum ordnance allowed was 600 kilograms. External fuel tanks, 7.62mm or 12.7mm machine guns, 20mm cannons, rocket launchers, bombs, or even guided missiles could be attached to the underwing stations.

Technical Data of S211

Geometrical dimensions	
wing span	8.43m
length	9.50m
height	3.80m
wing area	12.60m^2
Weight	
empty	1,700kg
maximum take-off (trainer)	2,700kg
(figher)	3,100kg
Engine	
thrust	1,135kg
in-craft fuel capacity	800liter
wing fuel capacity	670liter
fuselage feul capacity	130liter
Performance data (trainer with weight of 2,500kg)	
maximum allowable speed (MO.8)	740km/hr
maximum speed (6,000m level)	667km/hr
climbing rate (sea level)	21.4m/sec
loss-of-speed speed (full wing span)	155km/hr
practical climb limit	12,200m
continuous flight time	3.5hr
steady cruise overload	3.5g
take-off distance	500m
landing distance	704m

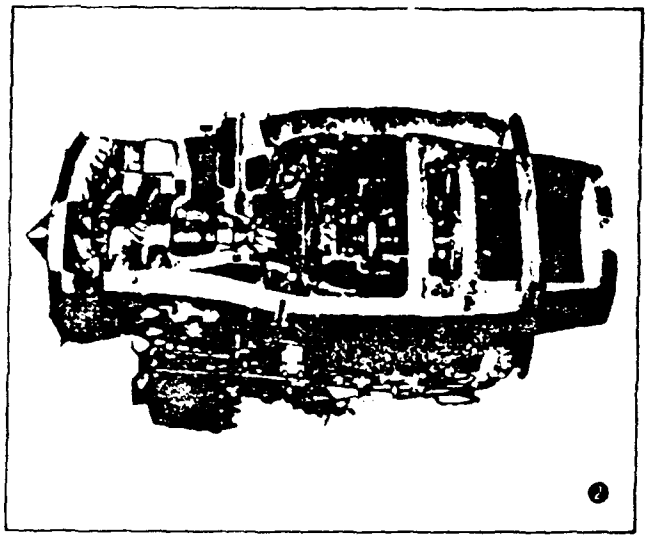
The three-way silhouette drawing of S211 trainer

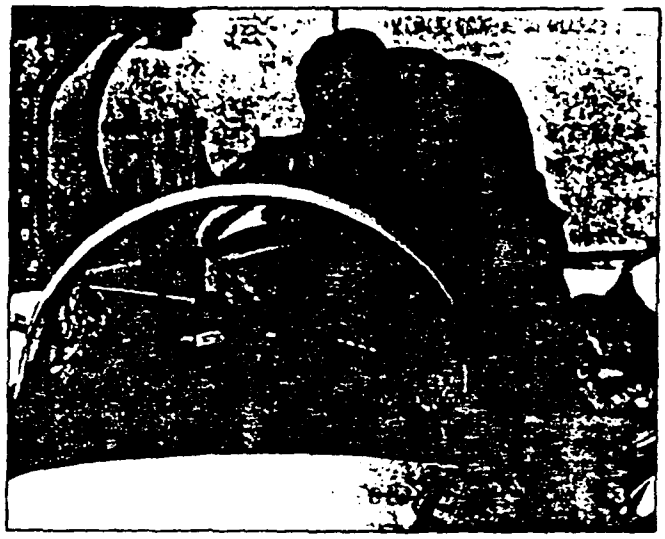


(1) Mr. Kerr of Italian Agusta group was being introduced to the officers of Chinese Air Force. Standing next to Mr. Kerr was Col. Shen, Minchi whol was also the staff editor of this magazine.

(2) JT15D-46 turbofan engine used by S211 trainer.

(3) A colonel naval aviation pilot tested the S211 trainer.





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